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ABSTRACT

This twenty-eighth in a series of twenty-nine learning modules on instructional execution is designed to give secondary and postsecondary vocational teachers help in developing the skills needed to plan for and use programmed instruction, either in the form of written texts or through teaching machines. Introductory sections relate the competencies dealt with here to others in the program and list both the enabling objectives for the three learning experiences and the resources required. Materials in the learning experiences include required reading, a self-check quiz with model answers, performance checklists, case studies to critique, model critiques, and the teacher performance assessment form for use in evaluation of the terminal objective. (The modules on instructional execution are part of a larger series of 100 performance-based teacher education (PBTE) self-contained learning packages for use in preservice or inservice training of teachers in all occupational areas. Each of the field-tested modules focuses on the development of one or more specific professional competencies identified through research as important to vocational teachers. Materials are designed for use by teachers, either on an individual or group basis, working under the direction of one or more resource persons/instructors.) (BM)

ED149092

MODULE

C-28

Employ Programmed Instruction

MODULE C-28 OF CATEGORY C—INSTRUCTIONAL EXECUTION
PROFESSIONAL TEACHER EDUCATION MODULE SERIES

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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CE 014 328

FOREWORD

This module is one of a series of 100 performance-based teacher education (PBTE) learning packages focusing upon specific professional competencies of vocational teachers. The competencies upon which these modules are based were identified and verified through research as being important to successful vocational teaching at both the secondary and post-secondary levels of instruction. The modules are suitable for the preparation of teachers in all occupational areas.

Each module provides learning experiences that integrate theory and application; each culminates with criterion referenced assessment of the teacher's performance of the specified competency. The materials are designed for use by individual or groups of teachers in training working under the direction and with the assistance of teacher educators acting as resource persons. Resource persons should be skilled in the teacher competency being developed and should be thoroughly oriented to PBTE concepts and procedures in using these materials.

The design of the materials provides considerable flexibility for planning and conducting performance-based preservice and inservice teacher preparation programs to meet a wide variety of individual needs and interests. The materials are intended for use by universities and colleges, state departments of education, post-secondary institutions, local education agencies, and others responsible for the professional development of vocational teachers. Further information about the use of the modules in teacher education programs is contained in three related documents: **Student Guide to Using Performance-Based Teacher Education Materials, Resource Person Guide to Using Performance-Based Teacher Education Materials** and **Guide to Implementation of Performance-Based Teacher Education.**

The PBTE curriculum packages are products of a sustained research and development effort by The Center's Program for Professional Development for Vocational Education. Many individuals, institutions, and agencies participated with The Center and have made contributions to the systematic development, testing, revision, and refinement of these very significant training materials. Over 40 teacher educators provided input in development of initial versions of the modules; over 2,000 teachers and 300 resource persons in 20 universities, colleges, and post-secondary institutions used the materials and provided feedback to The Center for revision and refinement.

Special recognition for major individual roles in the direction, development, coordination of testing, revision, and refinement of these materials is extended to the following program staff: James B. Hamilton, Program Director; Robert E. Norton, Associate Program Director; Glen E. Fardig, Specialist; Lois Harrington, Program Assistant; and Karen Quinn, Program Assistant. Recognition is also extended to Kristy Ross, Technical Assistant; Joan Jones, Technical Assistant; and Jean Wisenbaugh, Artist for their contributions to the final refinement of the materials. Contributions made by former program staff toward developmental versions of these materials are also acknowledged. Calvin J. Cotrell directed the vocational teacher competency research studies upon which these modules are based and also directed the curriculum development effort from 1971–1972. Curtis R. Finch provided leadership for the program from 1972–1974.

Appreciation is also extended to all those outside The Center (consultants, field site coordinators, teacher educators, teachers, and others) who contributed so generously in various phases of the total effort. Early versions of the materials were developed by The Center in cooperation with the vocational teacher education faculties at Oregon State University and at the University of Missouri-Columbia. Preliminary testing of the materials was conducted at Oregon State University, Temple University, and University of Missouri-Columbia.

Following preliminary testing, major revision of all materials was performed by Center Staff with the assistance of numerous consultants and visiting scholars from throughout the country.

Advanced testing of the materials was carried out with assistance of the vocational teacher educators and students of Central Washington State College; Colorado State University; Ferris State College, Michigan; Florida State University; Holland College, P.E.I., Canada; Oklahoma State University; Rutgers University; State University College at Buffalo; Temple University; University of Arizona; University of Michigan-Flint; University of Minnesota-Twin Cities; University of Nebraska-Lincoln; University of Northern Colorado; University of Pittsburgh; University of Tennessee; University of Vermont; and Utah State University.

The Center is grateful to the National Institute of Education for sponsorship of this PBTE curriculum development effort from 1972 through its completion. Appreciation is extended to the Bureau of Occupational and Adult Education of the U.S. Office of Education for their sponsorship of training and advanced testing of the materials at 10 sites under provisions of EPDA Part F, Section 553. Recognition of funding support of the advanced testing effort is also extended to Ferris State College, Holland College, Temple University, and the University of Michigan-Flint.

Robert E. Taylor
Director
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THE CENTER FOR VOCATIONAL EDUCATION
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The Center for Vocational Education's mission is to increase the ability of diverse agencies, institutions, and organizations to solve educational problems relating to individual career planning and preparation. The Center fulfills its mission by:

- Generating knowledge through research.
- Developing educational programs and products.
- Evaluating individual program needs and outcomes.
- Installing educational programs and products.
- Operating information systems and services.
- Conducting leadership development and training programs.

AAVIM

AMERICAN ASSOCIATION FOR VOCATIONAL INSTRUCTIONAL MATERIALS

Engineering Center
Athens, Georgia 30602

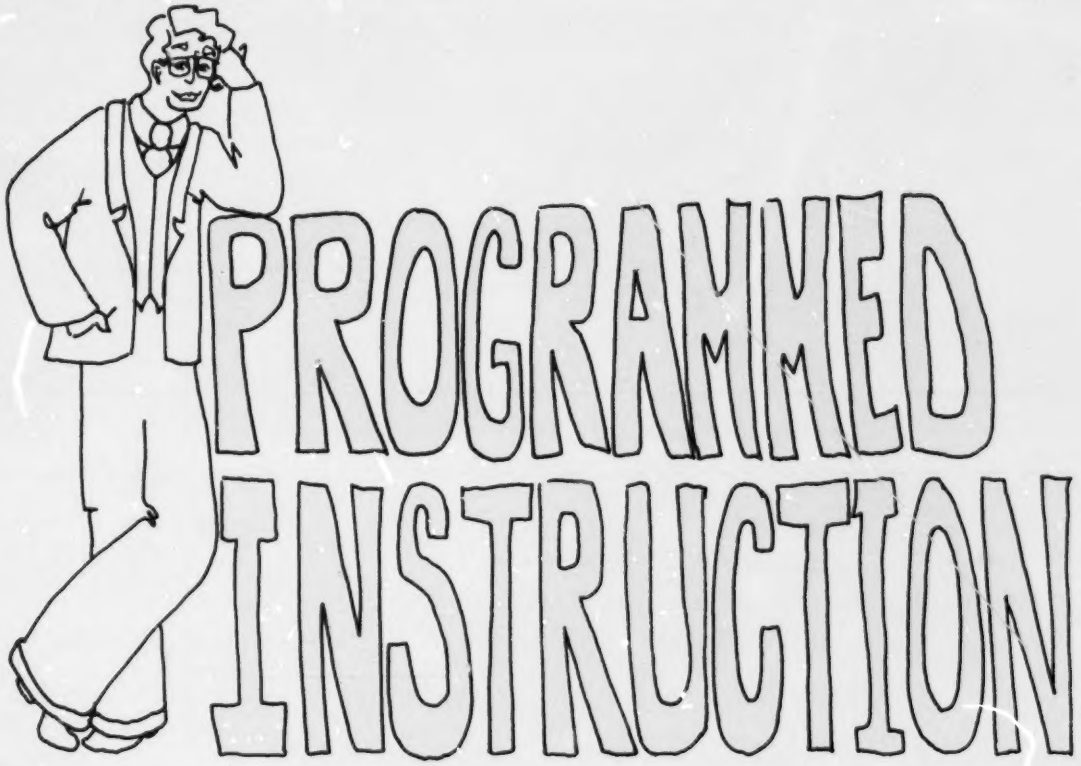
The American Association for Vocational Instructional Materials (AAVIM) is an interstate organization of universities, colleges and divisions of vocational education devoted to the improvement of teaching through better information and teaching aids.

INTRODUCTION

In recent years, programmed instruction, teaching machines, and computer assisted instruction have attracted a great deal of interest among vocational educators. More and more programmed instruction materials are being developed and used in the classroom, some of them presented through teaching machines.

Programmed instruction may be used for an entire course or just a unit or a lesson. It can be used as an enrichment technique with more capable learners, as an excellent teaching technique with average learners, or as a remedial technique for slower learners. Programmed instruction, if effectively used, can provide positive student learning experiences in many vocational education programs.

This module is designed to provide you with the skills you need to plan for and use programmed instruction, either in the form of written texts or through teaching machines.



ABOUT THIS MODULE

Objectives

Terminal Objective: In an actual school situation, employ programmed instruction. Your performance will be assessed by your resource person, using the Teacher Performance Assessment Form, pp. 45–46 (*Learning Experience III*).

Enabling Objectives:

1. After completing the required reading, demonstrate knowledge of the characteristics of programmed instruction (*Learning Experience I*).
2. For simulated situations, employ or critique the employment of programmed instruction (*Learning Experience II*).

Prerequisites

To complete this module, you must have competency in developing a lesson plan and selecting student instructional materials. If you do not already have these competencies, meet with your resource person to determine what method you will use to gain these skills. One option is to complete the information and practice activities in the following modules:

- *Develop a Lesson Plan*, Module B–4
- *Select Student Instructional Materials*, Module B–5

Resources

A list of the outside resources which supplement those contained within the module follows. Check with your resource person (1) to determine the availability and the location of these resources, (2) to locate additional references in your occupational specialty, and (3) to get assistance in setting up activities with peers or observations of skilled teachers, if necessary. Your resource person may also be contacted if you have any difficulty with directions, or in assessing your progress at any time.

Learning Experience I

Optional

Reference: Norton, Robert E. *Using Programed Instruction in Occupational Education*. Albany, NY: Bureau of Occupational Education Research, The State Education Department, The University of New York, 1967. ED 018 660

An audiovisual specialist or equipment dealer, or computer personnel with whom you can arrange to view a demonstration of the use of teaching machines.

Resources (e.g., libraries, resource centers, publishers, etc.) to visit or write to identify programmed materials available in your service area.

Learning Experience II

Required

1–3 peers to role-play students to whom you are presenting a lesson. If peers are unavailable, an alternate activity has been provided.

Programmed materials and equipment for presenting a lesson to a group of peers (required only if you select the above activity).

Optional

A teacher experienced in employing programmed instruction with whom you can consult.

A resource person to review the adequacy of your lesson plan.

Learning Experience III

Required

An actual school situation in which you can employ programmed instruction.

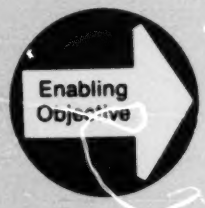
A resource person to assess your competency in employing programmed instruction.

This module covers performance element numbers 133–135 from Calvin J. Cotrell *et al.*, *Model Curricula for Vocational and Technical Education: Report No. V* (Columbus, OH: The Center for Vocational Education, The Ohio State University). The 384 elements in this document form the research base for all The Center's PBTE module development.

For information about the general organization of each module, general procedures for their use, and terminology which is common to all 100 modules, see About Using The Center's PBTE Modules on the inside back cover.

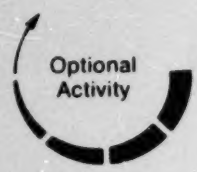
Learning Experience I

OVERVIEW



After completing the required reading, demonstrate knowledge of the characteristics of programmed instruction.

You will be reading the information sheet, The Characteristics of Programmed Instruction, pp. 7–20.



You may wish to read the supplementary reference, Norton, *Using Programed Instruction in Occupational Education*.

You may wish to meet with an audiovisual specialist, computer personnel, or a representative of an audiovisual equipment company to discuss and/or view a demonstration of the use of teaching machines, particularly the computer as a base for computer assisted instruction.

You may wish to identify current programmed materials available in your service area.

You will be demonstrating knowledge of the characteristics of programmed instruction by completing the Self-Check, pp. 21–22.

You will be evaluating your competency by comparing your completed Self-Check with the Model Answers, pp. 23–24.

Activity

For information on the characteristics of programmed instruction, including the various types of programmed materials, and the use of programmed texts and teaching machines, read the following information sheet:

THE CHARACTERISTICS OF PROGRAMMED INSTRUCTION

Programmed instruction is a method of instruction using programmed materials to achieve specified objectives. The following are important characteristics of programmed instruction:

- It involves the controlled presentation of material in a carefully planned sequence of steps which leads the student from his/her present state of knowledge to predetermined educational objectives.
- The student actively participates by continuously responding.
- The student is informed immediately as to whether each response is correct or incorrect.
- Each student progresses at his/her own pace.
- Materials involved are designed for use by individuals, though they might be used successfully in a group situation.

Programmed materials are designed specifically for this type of instruction. These materials may be in the form of **programmed texts** or special programs to be used in **teaching machines.** They are planned in units called **frames,** each of which provides the student with a small amount of information. Information is presented through a series of frames in a **logical sequence** to lead the student from what he/she knows to new and more complex knowledge and principles.

As the students study programmed materials, they are required to participate by providing a response relative to each frame. The correctness of each response is then revealed by the program materials.

Types of Programmed Materials

Based upon how a student responds, programs might be classified into either of two groups—(1) constructed-response (write-in) programs, or (2) multiple-choice response programs. **Constructed-response** programs require the students to write an answer in blanks provided in the frame or on an answer sheet. **Multiple-choice** response programs provide a number of responses, and the students are required to choose the correct one(s).

There are four major types of programmed materials: **linear, branching, combination,** and **mathetics.**

Linear Program

In a linear program, the sequence of frames is identical for all students. Information in such programs is arranged so each student proceeds from the first to the last item. Each student covers the answer column with a strip of paper or similar device, studies the information given in the frame, and then provides a response. This response is then compared with the correct answer given in the program. The student then proceeds to the next frame and follows this procedure throughout the program. Sample 1 is an excerpt from one linear program.

SAMPLE 1

EXCERPT FROM A LINEAR PROGRAM[1]

	1. Read the introduction and instructions to the program before you start. If you have not already done so, read the instruction sheet. After you read it proceed to frame 2.
metes and bounds	2. In the early days of the United States, land was parceled out to individuals in irregular shapes. The boundary lines were described by **metes** and **bounds.** Describing property lines that are irregular shapes is a description called by m_____and b_____.
point of beginning	3. Descriptions by metes and bounds have a **point of beginning,** such as a stake, fence post, tree, rock, road intersection or some natural feature. When a legal description for a piece of property is given by metes and bounds, the surveyor starts from a p_____ of b_____.
monuments	4. This point of beginning, such as a stake, tree, rock, etc., has been replaced by artificial permanent **monuments** that are below the frost line. They consist of metal pipes, steel pins and concrete posts. Permanent m_____s have replaced stakes, trees, rocks and road intersections as the point of beginnings.
bearings	5. Compass readings or **bearings** and the distance is given from the point of beginning to describe the property boundaries. The b_____ are the compass readings of the property that is being described.
True North	6. Bearings may be given by compass readings of Magnetic North or True North. **True North** is the compass reading that is usually used. The compass reading is usually the _____North. true magnetic
feet and decimals	7. Length or distance from the point of beginning in the early days was given in chains, poles or rods. These measurements are being replaced by **feet** and **decimals** secured from the **surveyor's tape.** The length from the point of beginning is given in _____ and _____ by the surveyor today.
surveyor's tape	8. The _____ is used in measuring the distance in feet and decimals from the point of beginning.

1. Gilbert A. Long *et al., A Visit in Surveying for Vocational Agriculture* (Olympia, WA: Agricultural Education Division, Washington State Board of Vocational Education, 1966), pp. 31–32.

Branching Program

More than one sequence or series of frames is possible through a **branching** (also known as intrinsic or adaptive) program. Each student follows the sequence determined by his/her responses. If the student responds correctly, he/she may be (1) provided additional in-depth information, (2) permitted to skip some information, or (3) provided information concerning the next topic. An incorrect response may lead the student to information concerning why the selected answer is incorrect or to remedial information. After an incorrect response, the student is usually required to return to the base frame and make another response.

Sample 2 shows excerpts from a branching program. As you review these excerpts, note the page number on each excerpt, and keep in mind that each of these excerpts would be on a separate page. Also note that these are not consecutive pages. In a branching program, a student proceeds according to his/her responses, not necessarily in a consecutive order. In this example, the answer given by the student to the question on p. 6 will send the student to either p. 9, p. 11, or p. 13. The correct response is on p. 13. When the student gets to the correct response, he/she responds to another question, sending him/her to p. 3, p. 5, or p. 8.

SAMPLE 2

EXCERPTS FROM A BRANCHING PROGRAM[2]

Section I **Page 1**

ANATOMY AND PHYSIOLOGY

Let's begin by meeting our patient, Mr. Marlin, who is resting quietly in a two-bed room. Mr. Marlin is a 52-year-old salesman who entered the hospital today in preparation for intrathoracic surgery.

In order to understand what will be going on within Mr. Marlin's chest during and after surgery, we'll briefly review some facts about the anatomy of this structure: Just beneath the layer of skin and fat which covers Mr. Marlin's chest lies the barrel-like chest wall—which encloses the front, sides, and back of the thoracic (chest) cavity.

The chest wall is composed of the thoracic skeleton (ribs, sternum, and thoracic vertebrae) which is interlaced and covered with the intercostal muscles to form a solid semi-rigid structure. The lower boundary or floor of the thoracic cavity is the diaphragm, which is composed of muscle.

Please go on to page 6.

2. Division of Nursing, Public Health Service, U.S. Department of Health, Education, and Welfare, *Closed Drainage of the Chest: A Programmed Course for Nurses* (Washington, DC: U.S. Government Printing Office, 1965), pp. 1,2,6,9,11,13. ED 023 828

Page 2

You're on the wrong page, so apparently you haven't understood the instructions.

In this book, you do not read the pages consecutively. To progress through the course, you must follow the directions you will find at the end of the page you're reading.

Please go back to page 1 and then turn to the page number indicated at the end of that page.

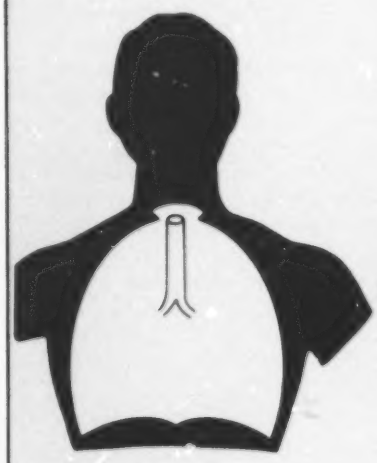
Page 8
(from page 1)

Although Mr. Marlin's thoracic cavity does contain two passageways which are open to the outside environment (the esophagus and trachea), the cavity itself is a closed structure. It is closed at its upper boundary by the superior mediastinum, which is connective tissue.

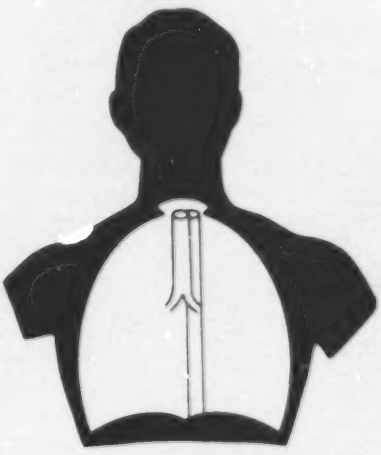
Mr. Marlin's esophagus and trachea pass downward into the encircling superior mediastinum on their way to the interior of the chest. The esophagus, of course, continues downward through the diaphragm to the stomach. About midway into the interior of the chest, the trachea ends in an inverted Y shape. Each of the two branches of the Y is a bronchus which, together with certain blood vessels, sometimes is called the "root" of the lung.

Now here is your first question. (Select the alternative you think is correct and turn to the page number shown beneath it.)

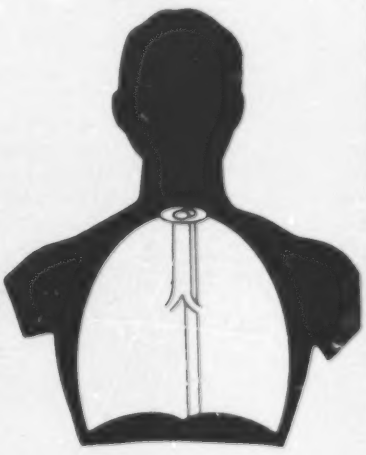
Which of the following simplified diagrams illustrates the situation we've described in the chest?



Page 9

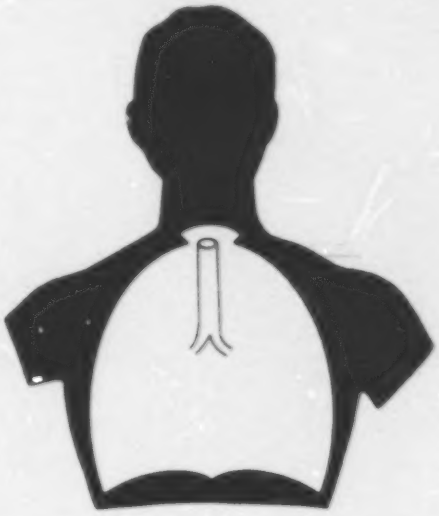


Page 11



Page 13

YOUR ANSWER: The diagram illustrates the situation we've described in the chest:



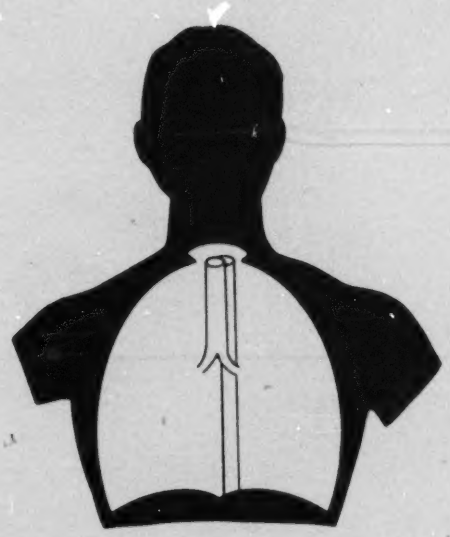
Almost.

And, in fact, you chose the diagram which shows structures which are relevant to this course. The diagram you selected represents the closed chest cavity with the trachea entering it through the superior mediatinum.

Apparently you forgot that we described the pathway of the esophagus which also passes into and through the chest—and through the diaphragm.

Please RETURN to page 6 and choose the diagram which is more complete than this one.

YOUR ANSWER: This diagram illustrates the situation we've described in the chest:



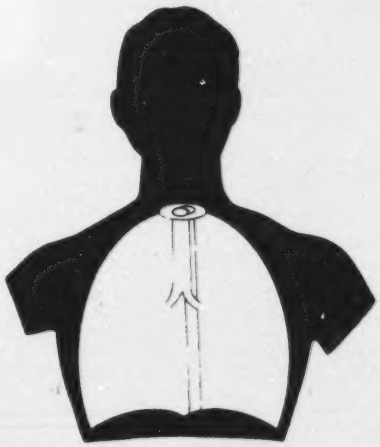
No, you forgot one very important detail.

Remember we said that the thoracic cavity is a closed structure. Its outer limits are the chest wall, the diaphragm, and the superior mediastinum.

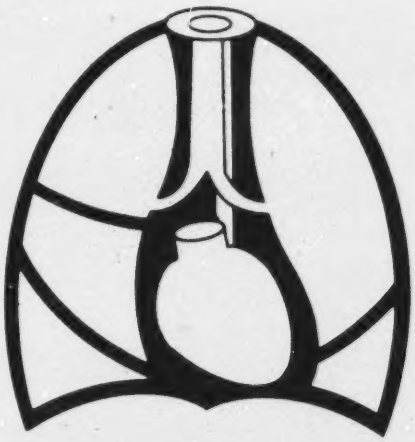
The esophagus and trachea enter the chest cavity through the superior mediastinum which ensheaths these two open passageways.

RETURN to page 6 and choose the diagram which represents the situation we've described.

YOUR ANSWER: This diagram illustrates the situation we've described in the chest:



You're right. It represents the closed thoracic cavity, with its outer limits being the chest wall, diaphragm, and superior mediastinum. Also shown are the pathway of the trachea and of the esophagus.



Now look at this diagram of Mr. Marlin's chest: We've added the heart, left lung (with two lobes), and right lung (three lobes). Note that the interior of the thoracic cavity can be divided into three distinct areas: (1) the medistinal area (approximately in the center of the cavity) and (2) and (3) a separate chamber for each lung.

The mediastinal area (of which the superior medistinum is the upper boundary) consists of connective tissue which ensheaths and holds together the esophagus, trachea, heart, aorta, other major vessels, etc. This area acts as a flexible partition which extends from front to back and top to bottom of the thoracic cavity.

(Now choose the alternative which correctly completes the following sentence.) The mediastinal area partitions the chest so that each lung:

Occupies its own closed cavity. page 3
Is bound to the other by connective tissue. page 5
Contains three major areas. page 8

Combination Program

A combination program simply combines the sequence characteristics of linear and branching programs. That is, one or more parts of the combination program are made up of a sequence of frames identical for all students, while one or more additional program parts are made up of frames through which the student's sequence is determined by his/her responses.

Mathetics Program

Mathetics is a relatively new type of program. Its format, when frames are used, resembles that of a branching program. Exercises are included which may be skipped entirely by those students already proficient but which may be completed by those needing more information. The major feature of this type is the degree of **task simulation** used.

Since advocates of this type of program hold that when more simulation is used, more transfer of learning occurs, many mathetical programs employ kits or simulators which include components quite similar to those used in the actual task as performed on the job. Printed matter in mathetics programs is usually filled with diagrams and pictures in various stages of completion. According to the mathetics concept, the active responses required of the student (e.g., finishing an incomplete diagram) simulate performance of the task he/she is learning.

There is little basis to favor any one of these four types of programs over the other. Specific types of programs are likely to prove of value in specific types of learning situations.

Linear Versus Branching Programs

Most programs available at this time would probably be classified as either **linear** or **branching.** Linear programs typically utilize the constructed-response technique (see Sample 1). When multiple-choice responses are used in linear programs, no explanations of wrong answers are provided, and the student is not able to skip known content or go through remedial sequences as often happens in branching programs. See Sample 3 for an example of **two** pages of a linear program using multiple-choice responses.

In 1926, S. L. Pressey developed a device for presenting multiple-choice questions on a revolving drum. The device used a multiple-choice, linear type program concept. The student depressed keys for the multiple-choice answers and knew immediately whether he/she was correct. His device has been called the first teaching machine. However, information was **not presented to** the student. The device was used for **testing** the student, not for programmed instruction.

B. F. Skinner of Harvard has been credited with the development of the constructed-response linear type program. He believed that learning was more effective when the student wrote his/her response and was immediately reinforced for a correct response. Programs of this type present information in sequence and in small units so most students will be able to respond correctly. A high percentage of errors is undesirable, and when they occur, the program is in need of revision.

SAMPLE 3

EXCERPT FROM A LINEAR PROGRAM USING MULTIPLE-CHOICE RESPONSES[3]

2 As a housekeeping aide, you are part of the hospital staff. You share in the hospital's main job, which is to help sick people get well. People often get sick with infections. When someone has an infection, it means that a harmful germ has got in inside his body and is growing there. Harmful germs	
☐ can grow inside a human body	can grow inside a human body.
☐ never grow inside a human body.	
3 Harmful germs live and grow inside the human body. They live and grow on objects, too. Harmful germs live on tables, floors, vacuum cleaners and mop heads. It is not until these harmful germs get inside a human body that an infection can begin. In which of these places could there be an infection? *(Check two answers.)*	
☐ A stomach.	A stomach.
☐ In the air.	
☐ On food.	
☐ On the floor.	
☐ In a cut.	In a cut.
☐ On bed linen.	
In which of these places could there be germs?	
☐ Bed linen.	
☐ Food.	
☐ A person's mouth.	
☐ In the air.	
☐ On the floor.	
☐ All of the above.	All of the above.

3. Health Care Facilities Service, Public Health Service, U.S. Department of Health, Education, and Welfare, *The Care and Cleaning of Housekeeping Equipment and the Storage Room in Health Facilities: A Programmed Course for Housekeeping Personnel* (Washington, DC: U.S. Government Printing Office, 1971), pp. 3–4.

Development of branching programs has been attributed to N. A. Crowder. In such programs, the student develops the sequence of frames by his/her responses to multiple-choice questions. A paragraph or more of information is presented in each frame in this type of program. The student studies the information and then selects a response to a given multiple-choice question. His/her response determines his/her sequence through the program.

There are several differences, other than those based on type of response and sequence, between the program types developed by Skinner and Crowder. Crowder-type programs present paragraphs of information in each frame, whereas Skinner-type programs give a sentence or two in each frame. The student spends more time making responses in the Skinner-type program and more time reading information in the Crowder-type program.

Some differences in theory are also noticeable. **Skinner-type** programs are based on the premise that learning occurs most effectively if a **correct response** is made and **immediately reinforced.** In **branching programs,** on the other hand, a basic assumption is made that the student learns from **success and mistakes.** Crowder maintains that effective learning takes place while the student reads, and that the multiple-choice testing is a confirmation of that learning.

By trying out and revising programs, Skinner believes a program writer can construct a good sequence of frames. On the other hand, Crowder contends that it is impossible to construct a sequence of frames best for all students. In a branching program each student may be individually routed by the use of sub-sequences which branch off from the main line. A failure at a crucial point leads to alternate remedial materials.

As was indicated earlier, there is no evidence at this time of the superiority of one type of program over the other. Both types have been shown to be effective. The quality of the program is of more importance than the theory upon which it is constructed.

Methods of Presenting Programmed Instruction

Information in programmed instruction may be presented to the student through either a **programmed text** or some type of **teaching machine.** Programmed texts are the most common method.

Programmed Texts

The programmed text does not require the use of additional devices for presentation of the information. A linear program may be in a horizontal or vertical format, while a scrambled format is used for branching programs.

In the **horizontal** format for a linear program, each frame is on one page while the correct response for the question in that frame is on another page. The student studies the frame, makes the required response, and then turns the page to find the correct response, and possibly, the next frame. Sample 4 shows seven items, and the correct responses for each item, from a linear program in which the horizontal format is used. Note that the responses are on a separate page from the items.

SAMPLE 4

EXCERPTS FROM A LINEAR PROGRAM USING THE HORIZONTAL FORMAT[4]

Chapter 1–1

1Q. Retail salesmanship refers primarily to the type of selling done in _____ stores.

21Q. An experienced clerk should use the _____ approach whenever possible.

41Q. When the first customer is ready to buy and a second customer approaches, you should look up, and merely nod to the second customer. This is the first _____ approach.

61Q. If we return to the f_____ customer in reasonably short time, he will not feel neglected.

81Q. The next important characteristic in the at_____ of the salesperson is courtesy.

101Q. In the third situation, if the salesperson has a very undecided customer, he should excuse himself and start the second customer looking at merchandise and return to the first c_____.

121Q. An alternative is to recommend merchandise which has a special price or which is a bargain to the c_____ who is looking.

1–2

1A. retail

21A. personal

41A. acknowledgement

61A. first

81A. attitude

101A. customer

121A. customer

4. *Salesmanship: A Programmed Text* (Emporia, KA: Kansas State Teachers College, 1965), pp. 7–8.

When the **vertical** format is used for a linear program, the frames are in sequence down the page as shown in Samples 1 and 3. This design necessitates that the student cover all material but the frame he/she is reading with a mask or shield, since the correct answer is printed either beside or below the frame being read. After the student responds, he/she exposes the correct response and the next frame. This design does not involve the constant turning of pages required by the horizontal format and permits the easy review of previous frames.

A special type of programmed text, often called a **scrambled** text, is used to present branching programs which use multiple-choice questions. Frames in the scrambled text are not presented in sequence but are scattered throughout. Each student begins with the first frame and makes his/her response. This response determines the next frame to be studied. If the correct response is given, the student will be directed to a frame with additional or new information. When an incorrect response is given, he/she will be directed to remedial information or to an explanation of why the selected answer is incorrect, and finally back to the base frame.

Some educators believe the use of programmed texts, regardless of the specific format involved, permits cheating in that the learner may look ahead for the correct answer without reading the information presented or responding to the question posed. Some feel it is important that the student be motivated enough to use the text in the correct manner. Others argue, however, that it does not matter how the students proceed through the program, so long as they learn the important content.

Teaching Machines

Another method of presenting programmed instruction, and one which helps to overcome the above objection to programmed texts, is the use of a teaching machine. A teaching machine is a mechanical, electrical, or electronic device or system which (1) permits information to be presented in a logical, organized sequence, (2) requires and records student responses, and (3) provides immediate feedback by indicating the correct response. Teaching machines really do not teach. Rather, the teaching depends on the instructional materials presented by the machine.

There are many varieties of teaching machines ranging from the very simple such as those which use mimeographed materials to electronic computers which require complicated programming systems. Machines are generally available for use with constructed-response linear programs and multiple-choice branching programs.

Among the newer innovations in teaching machines are the **audiovisual machines** and the **computer.** As its name implies, the audiovisual machine provides information by both visual and audio means to the student. These machines have been very successful in preparing individuals in industry and are currently finding favor among vocational educators who are developing independent study materials for use by students.

The most complex teaching machine and the one whose use is most rapidly spreading is the computer. *Computer assisted instruction (CAI)* has the potential for increasing the availability of independent study programs to students. In CAI, the student interacts with a computer system which contains stored programmed materials. CAI may take any of three forms: (1) drill and practice, (2) tutorial, or (3) conversational.

The **drill and practice** form of CAI is the least sophisticated form—a linear program. The student works frame by frame on a program, answering questions about previously learned material.

If the student has difficulty in providing the correct responses, the computer may direct the student to a remedial loop. After the difficulty is cleared up, he/she will be returned to the main program.

In the **tutorial** form, immediate decisions are made about which of many programmed sequences should be made available to the student. Such decisions are based on a student's previous answer and his/her relative achievement over the entire course.

The third form, **conversational,** represents an attempt to make provision for students who decide for themselves that they need extra review or practice or wish to skip some material. It permits students to ask questions of the computer. Generally, the computer acknowledges perceptive decisions, reproves hasty conclusions, answers good questions, and answers a bad question with another question. Characteristics desired in a conversational system include the computer's capability—

- to respond in terms of the previous portions of the conversation and the immediate question
- to reply with something relevant
- to make a decision whether to delay providing information requested by the student
- to provide answers based upon complex computations
- to participate in verbal interactions in an everyday language such as English

- to respond with questions or statements at any time
- to participate in nonverbal interactions involving tables, graphs, pictures, and sound

The conversational system must be prepared so the student will have complete freedom of use, including that of making irrelevant remarks.

CAI aids educators in placing the emphasis on individual help for students. The computer performs the role of the distributor of information, freeing the teacher to interact on a more personal level with the students.

Several factors in addition to its demonstrated capability of enhancing student achievement have contributed to the rapid growth of CAI. These include—

- the increasing use and development of programmed materials
- the increased availability of all types of electronic data processing equipment
- the increasing aid to education by the federal government

Several problems are common with the use of computers in vocational education. The language understood by computers frequently is not understood by the user (teacher or student). The methods of putting information into, and receiving information from, the computer are not always easy to understand. Computer hardware is very expensive as is the development, maintenance, and upkeep of necessary program materials. Because they were not involved in the design of the system they will be using, and because of the lack of staff training programs, educators often do not accept the use of computers.

There are many uses for teaching machines in education. In fact, such machines have proven to be generally effective. However, the effectiveness of teaching machines depends upon the presentation of quality programs, and these are difficult and costly to develop.

Advantages and Disadvantages of Programmed Instruction[5]

Many of the advantages and disadvantages of using programmed materials have been mentioned in earlier sections of this information sheet. The most important are summarized here.

Advantages

- They are self-paced, permitting each student to move through the frame sequence at his/her own speed.
- The teacher is freed from the routine and drillmaster tasks of instruction, thus allowing more time for creative and interpersonal activities with students.
- They can be used for successfully teaching most kinds of information and certain skills.
- Programmed materials are efficient—unnecessary verbiage is eliminated, and only information crucial in terms of the objectives remains.
- The information presented is organized and sequenced for individual readiness.
- They are based on generally accepted theories of education and psychology.
- Using such materials, the student, once oriented and motivated, can learn independently, in either a formal or informal educational setting.
- A single teacher can monitor and help individual students who are working on a variety of programs at any one time.
- Learning tends to be of higher quality for all students because of the individual pacing and better control over what is presented and how it is presented.
- The relatively low error rate of most programmed materials is a great motivational tool in itself—especially for slower learners who may be successful at learning for the first time.

5. Adapted from Robert E. Norton, *Using Programed Instruction In Occupational Education* (Albany, NY: Bureau of Occupational Education Research, The State Education Department, The University of the State of New York, 1967), pp. 12–13.

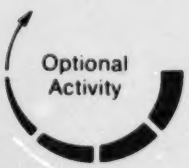
Disadvantages

- Such materials cannot take the place of skilled teachers or good educational facilities.
- They cannot solve educational problems such as overcrowded classrooms.
- They cannot be used with success in classrooms where teachers are hostile toward their use.
- Effective instruction cannot be provided unless the materials have been properly prepared and tested.
- Some students become bored after working with programmed materials for relatively long periods of time.
- Administrative problems of scheduling may arise when students using programmed materials and finishing at different times are scheduled for subsequent training as an intact group.
- Educators who use programmed materials in an instructional setting must be trained in the use of, and in the classroom management of, such materials.
- Selection of quality materials that will fit in with or complement the existing curriculum is not easy.
- Costs are involved in acquiring the programmed materials, preparing teachers to use them, and evaluating them.
- The number of quality programs available is very limited in some content areas, including many program areas in vocational education.

Summary

Programmed instruction is just one of several methods of instruction available to vocational educators. It has been generally accepted by both students and vocational educators. Programmed materials, when used appropriateiy, can result in increased individual achievement among all levels of students—more capable, average, and slower learners.

Programmed instruction (with or without teaching machines) does not replace teachers. It allows the teacher to spend more time teaching and less time with rote learning and memorization. Additional time is also made available for the individual guidance of students.



For additional information on the characteristics of programmed instruction, the kinds of materials available in occupational education and their sources, and suggestions for selecting and using such materials, you may wish to read Norton, *Using Programed Instruction in Occupational Education*.

You may wish to arrange through your resource person to meet with an audiovisual specialist, computer personnel, or a representative of an audiovisual equipment company to discuss the teaching machines which are available, and/or to view a demonstration of the use of teaching machines, particularly the computer as a base for computer assisted instruction.

To get a realistic idea of just what programmed materials are available in your service area, you may wish to write to, or visit in person, one or more of the following: publisher, library, state department, school-district or university-based resource center, resource person, inservice teacher, etc.

The following items check your comprehension of the material in the information sheet, The Characteristics of Programmed Instruction, pp. 7–20. Each of the seven items requires a short essay-type response. Please explain fully, but briefly, and make sure you respond to all parts of each item.

SELF-CHECK

1. You have been asked to give a presentation to teachers unfamiliar with programmed instruction. Briefly, how would you define programmed instruction for them?

2. A teacher of a vocational education subject may choose from two methods for presenting programmed instruction. What are these methods? Which would you recommend be used? Why?

3. Based upon how the student responds, programs may be classified into two groups. How would you describe these two groups of programs? Which would you recommend be used? Why?

4. How would you distinguish among the following types of programmed materials: linear, branching, and combination?

5. Distinguish between the Skinner-type and Crowder-type programs.

6. Define teaching machines.

7. CAI involves using the most complex of teaching machines: the computer. What information could you give, keeping in mind its advantages and disadvantages, that would aid a vocational teacher in making a decision as to whether CAI would be useful in his/her program?

Compare your written responses on the Self-Check with the Model Answers given below. Your responses need not exactly duplicate the model responses; however, you should have covered the same **major** points.

MODEL ANSWERS

1. Programmed instruction is a method of using programmed materials for educational purposes. Important characteristics of this type of instruction are as follows.
   - The material to be learned is presented in a sequence of small steps.
   - The student actively participates by making responses.
   - The student knows immediately if the response is correct or incorrect.
   - The student progresses at his/her own pace.
   - It is designed for use by individuals.
2. The two methods designed for presenting programmed instruction are programmed texts and special programs for teaching machines. The form used by the teacher would depend on several factors such as personal choice of teacher, facilities available, programmed materials available for use, and available funding. At the present time, there is no evidence that one method is better than the other.
3. The two groups of programs based upon the type of student response are constructed response or write-in materials, and multiple-choice response materials. Constructed response materials require the student to compose the entire response and write it in blanks provided in the frame or on an answer sheet. Multiple-choice response materials provide a number of responses for each frame. The students are required to choose the correct one(s).

   The type of text chosen depends upon the following: personal choice of teacher, facilities available, materials available for use, and whether it is desired that the students compose their own response or just be able to identify the proper response.
4. These three types of programs may be distinguished by the following characteristics:
   - The frames encountered in a **linear** program are identical for all students. Each student proceeds from the first to last frame by reading each frame, making a response, checking the response, and proceeding to the next frame.
   - More than one sequence or route is possible through a **branching** program. The sequence followed is determined by the student's response. A correct response may allow the student to skip some information, be provided more in-depth information, or be provided information concerning the next topic. An incorrect response may lead the student to information telling why the response was incorrect or to remedial information following which he/she is usually required to return to the base frame and make another response.
   - A **combination** program combines the sequence characteristics of linear and branching programs. Part of the program is made up of sequences followed by all students and part made up of frames through which the student's sequence is determined by his/her responses.
5.

	Crowder-type	**Skinner-type**
a.	multiple-choice branching type program	constructed-response linear type program
b.	paragraphs of information given in each frame	information provided in sentences or small units
c.	student spends more time reading information	student spends more time responding
d.	learning occurs from both success and mistakes	learning occurs by making correct response and getting immediate reinforcement

6. A teaching machine is a mechanical, electrical, or electronic device or system which presents information in a logical, organized sequence; requires and records student response; and provides immediate feedback by indicating the correct response.

7. In computer assisted instruction, the student interacts with a computer system which contains stored programmed materials. CAI allows for independent study by students and frees the teacher to give more personal help to students. It has been shown to greatly enhance student achievement.

Some problems to consider in the use of CAI in vocational education are: (1) computer language is complex; (2) computers and the necessary materials for their use are expensive; and (3) some educators are reluctant to use computers because they were not involved in the design of the system and have not been properly trained to use them.

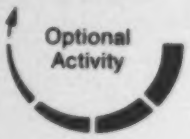
LEVEL OF PERFORMANCE: Your completed Self-Check should have covered the same **major** points as the model responses. If you missed some points or have questions about any additional points you made, review the material in the information sheet, The Characteristics of Programmed Instruction, pp. 7–20, or check with your resource person if necessary.

Learning Experience II

OVERVIEW

For simulated situations, employ or critique the employment of programmed instruction.

You will be reading the information sheet, Using Programmed Instruction, pp. 27–29.



You may wish to arrange through your resource person to meet with a teacher experienced in using programmed instruction.

NOTE: The next six items involve role-playing with peers. If peers are not available to you, proceed directly to the explanation of the alternate activity which follows.

You will be selecting a student performance objective in your occupational specialty that lends itself to using programmed instruction.

You will be selecting, modifying, or developing a lesson plan designed to achieve that objective using programmed instruction.

You may wish to have your resource person review the adequacy of your plan.

You will be selecting, obtaining, and previewing the programmed materials needed for your presentation, and making arrangements to secure any required equipment.

You will be presenting the lesson to a group of peers.

Your competency in employing programmed instruction will be evaluated by your peers, using the Programmed Instruction Checklist, pp. 31–36.

You will be reading the Case Studies, pp. 37–39, and writing critiques of the performance of the teachers described.

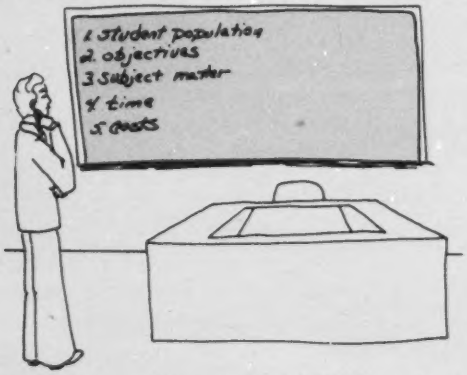
You will be evaluating your competency in critiquing the teachers' performance in employing programmed instruction by comparing your completed critiques with the Model Critiques, pp. 41–42.

Activity

For information relevant to using programmed instruction to achieve unit and lesson objectives, read the following information sheet:

USING PROGRAMMED INSTRUCTION

Programmed instruction should be used in the classroom only when it is felt that it is an efficient and effective method for achieving your unit and lesson objectives. In determining which instructional method would be most effective, you should consider the characteristics of your students, the objectives of the unit or lesson, the subject matter to be covered, the available time, and the comparable costs of the various methods of instruction.



This is not usually an easy decision. It has been demonstrated that programmed instruction can be used in teaching almost any subject. Students can be taught cognitive information such as definitions of medical terms as well as psychomotor skills such as sharpening various hand tools. However, programmed instruction appears to be most effective for **teaching cognitive material.**

Since programmed instruction is self-instructional in nature, programmed materials can generally be used in a formal educational setting such as the classroom or laboratory, or in an informal setting such as the student's home. In the formal setting, programmed instruction might be used as the sole instructional method, or it might be used along with other instructional methods such as discussions and demonstrations. Using programmed materials permits your role to shift from one of giving information to that of guiding instruction, analyzing the results of instruction, and tutoring students.

The student away from the formal setting generally does not have a teacher available to help him/her review subjects already taught or prepare for subjects to be taught. Programmed materials can serve as a private "tutor" for review purposes or to introduce the essential lessons of the course. They can also be used in remedial assignments for students who need extra help or to accelerate highly qualified learners.

It has been shown that programmed materials might be used effectively for—

- presenting a unit or lesson to students in an entire class
- supplementing instruction for students having difficulties or for accelerated learners
- providing "catch-up" material for late entrants or learners who have been absent
- providing a means of offering an "additional course" or homework assignments
- motivating students especially interested in, or capable of, learning through this means

Selecting Programmed Materials

Once you have decided that programmed instruction is the most efficient method of achieving a particular objective, the programmed materials to be used must be selected. Programmed materials are not available for all areas of a specific subject. However, an increasing number are becoming available in a variety of subject matter areas.

In selecting appropriate programmed materials, the following factors should be considered.

- Were the materials prepared by reputable and authoritative personnel?

- Do the materials exhibit quality workmanship?
- Are the performance objectives clearly specified?
- Do the materials cover the desired content areas?
- Are the materials free of ethnic, sex, and racial bias and other undesirable content?
- Do the materials contain accurate, up-to-date information?
- Do the materials require a realistic amount of time for completion?
- Have the materials been shown to be effective through a valid field test?
- Are the materials worth their cost in terms of instructional value?
- Are the materials appropriate for the students' level of ability?
- Do the contents reflect students' needs and interests?
- Are the materials suited for use in the existing classroom and laboratory facilities?
- Do the materials provide relevant learning activities in terms of the unit and lesson objectives?
- Do the materials contain adequate examples and illustrations?

It is important that you evaluate the materials in terms of these factors, because the mere availability of materials is no guarantee of their quality. Good programmed materials not only permit participating students to progress at their own rate, but also may take many of the students much farther into the subject than would be possible were they limited to the pace of other students.

Since the availability of materials is a constantly changing factor, it is suggested that you refer to current indexes of such materials as the need arises. Communications with other vocational educators as well as representatives of relevant publishers can be of help in identifying suitable materials.

After selecting quality programmed materials, you must become completely familiar with the contents of the materials. You need to do this so that you will be prepared to respond to student comments or questions concerning the program content, to guide the student in the proper use of the materials, and to make available the required materials and equipment.

Using Programmed Materials

Once the materials are selected and you have become familiar with their contents, you are ready to use them in an instructional setting. As a first step, you should arrange the physical setting in advance as required by the learning activities. All materials and equipment required for the learning activities should be assembled in advance. The equipment should be set up according to the manufacturer's recommendations.

After the environment is prepared, you should explain the use of the programmed materials to your students. As part of this explanation, differences between conventional learning materials (e.g., textbooks) and programmed materials should be discussed. Ways in which the programmed materials are to be obtained and reviewed, and how responses are to be given should be demonstrated, particularly if complex teaching machines are involved. In addition, the proper use of introductions, reviews, summaries, self-tests, and other program components or accessories should be explained.

Students must recognize that learning from programmed materials is quite different from the usual group learning activities of the classroom. They must understand that they will be working with the materials individually rather than interacting with the group.

If programmed texts are being used, the students should be informed that "looking ahead" for the correct answers may result in less learning and may actually penalize them. They should also understand that they should proceed at their own pace. In addition, you should point out that you will be available to help those students who encounter difficulties since few, if any, programs are so con-

structed that they anticipate all unforeseen questions or problems.

Following such an explanation, you should supervise the students' use of programmed materials. Care should be taken that environmental conditions such as lighting, temperature, ventilation, and noise are controlled so as to facilitate learning. The entire setting should reflect an orderly, businesslike atmosphere.

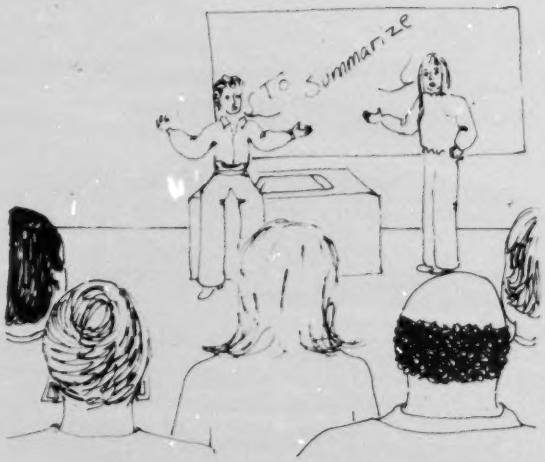
Since programmed instruction demands active and continuous participation by the student, the student may find it more demanding and more strenuous than traditional classroom instruction. Thus, he/she may experience fatigue more quickly. For this reason, you should attempt to keep the learning activities relatively brief and to integrate a variety of other activities into long study periods.

In addition, you should supplement programmed materials with other materials and media. For example, an appropriate film, a suitable audiotape, or a field trip might be interjected at an appropriate time in the unit. Making available a variety of relevant learning activities and media will not only tend to foster more interest in the subject, but may also serve to motivate students to explore a subject on their own.

Using programmed instruction may eliminate some of the homogeneity of the class as more capable learners achieve objectives more rapidly than the slower learners in the class. Because of this, you will find it necessary to provide enrichment or other worthwhile activities for students who complete the program early, and to keep track of the progress of each student using the materials.

As students make use of programmed materials, you should move quietly and inconspicuously about the classroom or laboratory, supplementing the programmed materials, checking student progress, and helping individual students. The role of the teacher in programmed instruction changes. The teacher is freed from the burden of providing routine instruction in facts, computations, and the like and has more time available to do the things that only he/she can do and to interact with individual students.

As a final step, the lesson or unit should be summarized. As part of the summary, you or your students should present a summary of the program content. Student feedback relative to their understanding of the information presented should be sought as part of the summarizing activities.



Optional Activity

You may wish to arrange through your resource person to meet with and interview a vocational teacher in your service area who is experienced in employing programmed instruction. You may wish to structure the interview around certain key questions, e.g.,

- What quality programmed materials are available for your service area?
- For what purposes, or in what situations, does he/she use programmed instruction with students?
- Does he/she use programmed texts, teaching machines, or both to present programmed instruction? If both, how do the two methods differ in terms of effectiveness, classroom procedures for use, student reaction, etc.?

NOTE: The following activities involve role-playing with peers. If peers are not available to you, turn to p. 37 for an explanation of the alternate activity.

Select a student performance objective in your occupational specialty which could be achieved, at least partially, through the use of programmed instruction. (In a real world situation, you start with an objective and then select the most appropriate materials and/or teaching methods. In this practice situation, however, you need to select an objective that lends itself to using programmed instruction.)

Prepare a detailed lesson plan which includes an explanation of what programmed materials are needed, how they will be used, and when. Instead of developing a lesson plan, you may select a lesson plan that you have developed previously, and adapt that plan so that it includes the use of programmed instruction.

You may wish to have your resource person review the adequacy of your plan. He/she could use the Teacher Performance Assessment Form in Module B–4, *Develop a Lesson Plan*, as a guide.

Based on your lesson plan, select, obtain, and preview the programmed materials you will need to make your presentation. Also, arrange to have any necessary equipment available when you make your presentation.

In a simulated classroom situation, present your lesson to a group of one to three peers. These peers will serve two functions: (1) they will role-play the students to whom you are presenting your lesson, and (2) they will evaluate your performance.

Multiple copies of the Programmed Instruction Checklist are provided in this learning experience. Give a copy to each peer before making your presentation in order to ensure that each knows what to look for in your lesson. However, indicate that during the lesson, all attention is to be directed toward you and the educational activities, and that the checklists will be completed **after** the lesson is finished.

PROGRAMMED INSTRUCTION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

	LEVEL OF PERFORMANCE			
	N/A	No	Partial	Full
In employing programmed instruction, the teacher:				
1. took into consideration the following factors:				
a. the needs, interests, and abilities of the students	☐	☐	☐	☐
b. the lesson objective(s)	☐	☐	☐	☐
c. the subject matter to be covered	☐	☐	☐	☐
d. the available time	☐	☐	☐	☐
e. the relative costs of different instructional methods	☐	☐	☐	☐
2. selected programmed materials which met the following criteria:				
a. prepared by reputable personnel	☐	☐	☐	☐
b. exhibit quality workmanship	☐	☐	☐	☐
c. clearly specify the performance objectives to be achieved	☐	☐	☐	☐
d. contain relevant content	☐	☐	☐	☐
e. contain accurate information	☐	☐	☐	☐
f. contain up-to-date information	☐	☐	☐	☐
g. require a realistic amount of time for completion	☐	☐	☐	☐
h. written at an appropriate level of difficulty	☐	☐	☐	☐
i. field tested and shown to be effective	☐	☐	☐	☐
j. worth their cost in relation to instructional value	☐	☐	☐	☐
k. suited for use in existing facilities	☐	☐	☐	☐
l. free of bias and other undesirable content	☐	☐	☐	☐
m. contain adequate examples and illustrations	☐	☐	☐	☐
3. made available all necessary materials and equipment	☐	☐	☐	☐

	N/A	No	Partial	Full
4. set up any required equipment according to the manufacturer's recommendations	☐	☐	☐	☐
5. arranged the physical setting in advance to facilitate the learning activities for each student	☐	☐	☐	☐
6. responded to students' comments or questions concerning the materials and how to use them	☐	☐	☐	☐
7. explained the use of the materials to students, including:				
a. the differences between conventional learning materials and the programmed format	☐	☐	☐	☐
b. how to gain access to, review, and respond to materials	☐	☐	☐	☐
c. the proper use of introductions, reviews, summaries, self-tests, and other program information and equipment	☐	☐	☐	☐
8. supervised the students' use of programmed materials, including:				
a. maintaining an orderly, businesslike learning setting free from distractions	☐	☐	☐	☐
b. moving quietly and inconspicuously about the room supplementing the programmed materials, checking student progress, and helping individual students	☐	☐	☐	☐
c. providing enrichment activities for students who complete the program early	☐	☐	☐	☐
9. summarized, or had students summarize, the program content	☐	☐	☐	☐
10. obtained student feedback on their understanding of the information presented	☐	☐	☐	☐

LEVEL OF PERFORMANCE: All items must receive N/A, or FULL responses. If any item receives a NO, or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

PROGRAMMED INSTRUCTION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

LEVEL OF PERFORMANCE

	N/A	No	Partial	Full
In employing programmed instruction, the teacher:				
1. took into consideration the following factors:				
a. the needs, interests, and abilities of the students	☐	☐	☐	☐
b. the lesson objective(s)	☐	☐	☐	☐
c. the subject matter to be covered	☐	☐	☐	☐
d. the available time	☐	☐	☐	☐
e. the relative costs of different instructional methods.	☐	☐	☐	☐
2. selected programmed materials which met the following criteria:				
a. prepared by reputable personnel	☐	☐	☐	☐
b. exhibit quality workmanship	☐	☐	☐	☐
c. clearly specify the performance objectives to be achieved	☐	☐	☐	☐
d. contain relevant content	☐	☐	☐	☐
e. contain accurate information	☐	☐	☐	☐
f. contain up-to-date information	☐	☐	☐	☐
g. require a realistic amount of time for completion	☐	☐	☐	☐
h. written at an appropriate level of difficulty	☐	☐	☐	☐
i. field tested and shown to be effective	☐	☐	☐	☐
j. worth their cost in relation to instructional value	☐	☐	☐	☐
k. suited for use in existing facilities	☐	☐	☐	☐
l. free of bias and other undesirable content	☐	☐	☐	☐
m. contain adequate examples and illustrations	☐	☐	☐	☐
3. made available all necessary materials and equipment	☐	☐	☐	☐

	N/A	No	Partial	Full
4. set up any required equipment according to the manufacturer's recommendations	☐	☐	☐	☐
5. arranged the physical setting in advance to facilitate the learning activities for each student	☐	☐	☐	☐
6. responded to students' comments or questions concerning the materials and how to use them	☐	☐	☐	☐
7. explained the use of the materials to students, including:				
a. the differences between conventional learning materials and the programmed format	☐	☐	☐	☐
b. how to gain access to, review, and respond to materials	☐	☐	☐	☐
c. the proper use of introductions, reviews, summaries, self-tests, and other program information and equipment	☐	☐	☐	☐
8. supervised the students' use of programmed materials, including:				
a. maintaining an orderly, businesslike learning setting free from distractions	☐	☐	☐	☐
b. moving quietly and inconspicuously about the room supplementing the programmed materials, checking student progress, and helping individual students	☐	☐	☐	☐
c. providing enrichment activities for students who complete the program early	☐	☐	☐	☐
9. summarized, or had students summarize, the program content	☐	☐	☐	☐
10. obtained student feedback on their understanding of the information presented	☐	☐	☐	☐

LEVEL OF PERFORMANCE: All items must receive N/A, or FULL responses. If any item receives a NO, or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

PROGRAMMED INSTRUCTION CHECKLIST

Directions: Place an X in the NO, PARTIAL, or FULL box to indicate that each of the following performance components was not accomplished, partially accomplished, or fully accomplished. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

LEVEL OF PERFORMANCE

	N/A	No	Partial	Full
In employing programmed instruction, the teacher:				
1. took into consideration the following factors:				
a. the needs, interests, and abilities of the students	☐	☐	☐	☐
b. the lesson objective(s)	☐	☐	☐	☐
c. the subject matter to be covered	☐	☐	☐	☐
d. the available time	☐	☐	☐	☐
e. the relative costs of different instructional methods	☐	☐	☐	☐
2. selected programmed materials which met the following criteria:				
a. prepared by reputable personnel	☐	☐	☐	☐
b. exhibit quality workmanship	☐	☐	☐	☐
c. clearly specify the performance objectives to be achieved	☐	☐	☐	☐
d. contain relevant content	☐	☐	☐	☐
e. contain accurate information	☐	☐	☐	☐
f. contain up-to-date information	☐	☐	☐	☐
g. require a realistic amount of time for completion	☐	☐	☐	☐
h. written at an appropriate level of difficulty	☐	☐	☐	☐
i. field tested and shown to be effective	☐	☐	☐	☐
j. worth their cost in relation to instructional value	☐	☐	☐	☐
k. suited for use in existing facilities	☐	☐	☐	☐
l. free of bias and other undesirable content	☐	☐	☐	☐
m. contain adequate examples and illustrations	☐	☐	☐	☐
3. made available all necessary materials and equipment	☐	☐	☐	☐

	N/A	No	Partial	Full
4. set up any required equipment according to the manufacturer's recommendations	☐	☐	☐	☐
5. arranged the physical setting in advance to facilitate the learning activities for each student	☐	☐	☐	☐
6. responded to students' comments or questions concerning the materials and how to use them	☐	☐	☐	☐
7. explained the use of the materials to students, including:				
a. the differences between conventional learning materials and the programmed format	☐	☐	☐	☐
b. how to gain access to, review, and respond to materials	☐	☐	☐	☐
c. the proper use of introductions, reviews, summaries, self-tests, and other program information and equipment	☐	☐	☐	☐
8. supervised the students' use of programmed materials, including:				
a. maintaining an orderly, businesslike learning setting free from distractions	☐	☐	☐	☐
b. moving quietly and inconspicuously about the room supplementing the programmed materials, checking student progress, and helping individual students	☐	☐	☐	☐
c. providing enrichment activities for students who complete the program early	☐	☐	☐	☐
9. summarized, or had students summarize, the program content	☐	☐	☐	☐
10. obtained student feedback on their understanding of the information presented	☐	☐	☐	☐

LEVEL OF PERFORMANCE: All items must receive N/A, or FULL responses. If any item receives a NO, or PARTIAL response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

The following Case Studies describe how two vocational teachers went about planning for and using programmed instruction. Read each of the case studies and then explain in the space provided (1) the strengths of the teacher's approach, (2) the weaknesses of the teacher's approach, and (3) how the teacher should have treated his/her responsibilities.

CASE STUDIES

Case Study 1:

Ms. Mabe moved happily about the classroom making last minute preparations for her class. She decided to make sure she had enough of the programmed texts for each student. Glancing around the room she noted that everything—the physical setting, as well as the required materials and supplies—were in readiness for the members of her class.

She had looked forward to teaching this unit for several days. Several years ago she discovered a programmed text on parliamentary procedure which she decided to use on a continuing basis as part of the students' leadership training experiences. Her past experiences with the use of the text had shown that this would give her about five easy classes—classes in which she could get other pressing work completed. These periods would be of particular value this year as she needed to work on some reports required by the state.

As soon as the students came into the classroom and settled in their seats, Ms. Mabe explained the type of text they would be using and demonstrated how it was to be used. She emphasized that the text was self-instructional in nature and that any communication with others in the room should be held to a minimum. She noted that she had very important reports to complete and would appreciate the students' cooperation.

Once the students were quietly at work, Ms. Mabe settled at her desk to work on her reports. About midway through the class period, students began to parade to her desk to ask questions about the program, particularly some of the terms used. As the period progressed, Ms. Mabe's answers became curt. She was relieved when the period was over.

For the next class, Ms. Mabe made sure everything was prepared for the students, including making several dictionaries available. After the students arrived, she announced that they should continue their study of the programmed texts. She also specified that, rather than interrupting her work, students should use the dictionaries to find definitions for unfamiliar terms.

At the end of the period, Ms. Mabe was very happy. The period had proceeded smoothly without her being interrupted once.

Ms. Mabe was extremely pleased when the third period passed in the same manner. But finally, two students during the fourth class period interrupted her again. They had completed the programmed text and wanted to know what they should do next. Ms. Mabe suggested that they review the programmed material and then work on a personal project of their own choosing. She then repeated the suggestion to the whole class so they would not have to interrupt her work.

Near the end of the fifth class period Ms. Mabe began to summarize the program content. In trying to check the students' understanding of the information presented, she was surprised to discover that one-fourth of the students had not yet completed the texts. Ms. Mabe was even more surprised to hear the students' negative comments about the programmed materials.

Case Study 2:

Fred Beaty had been teaching electronics in the Russel County Area Vocational-Technical Center for three years. During this period, he had developed and used programmed materials presented through several programmed texts with a great deal of success. In fact, during the third year, his first-year course involved only programmed materials, some audiovisual aids, and project work in the electronics laboratory.

After his third successful year, the Center had received a new computer which was not being fully utilized. Mr. Beaty proposed to the Center director that the computer be used as a base for computer assisted instruction for first-year electronics students. He requested release time to prepare an electronics program which could be placed on the computer, and asked that four teletype terminals with video capabilities be purchased and placed in the electronics laboratory. After considering the request, the director gave his approval with the stipulation that use of the terminals be shared with the Instructional Materials Center (IMC).

With this approval, Mr. Beaty proceeded, with the help of a computer programmer, to prepare the linear material from the programmed texts for storage in the computer. Because it was just a direct transfer of educational material from a text to a computer program, the work proceeded rapidly.

In fact, the computer program was completed about one month before the next school term was to begin. Even the terminals came in on schedule.

However, it was at this point that changes in the original plan became necessary. The size and sensitivity of the terminals made it impossible for them to be easily moved. For this reason, they had to be installed in one readily accessible location. Since Mr. Beaty could not have students from many subject matter areas moving in and out of his laboratory, it was decided they would be placed in the IMC, which was located at the other end of the building. However, usage priority would be given to the first-year electronics students.

About this time it was discovered that too few qualified students (those possessing the established specifications of prior knowledge and abilities) had requested enrollment in the first-year electronics class. In fact, to get the required fifteen, six individuals who did not meet the requirements had to be enrolled. It was the first time this situation had occurred.

Mr. Beaty prepared to meet the class on the first day of school. He assembled the programmed

texts which had been used the third year, planning to use them until major gaps in student performance developed. As the gaps developed, he anticipated that the students would be encouraged to use the computer.

On the first day of class, he met with the students, explaining the instructional processes which would be used, providing each student with a copy of the first programmed text, and demonstrating how the materials would be used. Within a few days the progress of some students was very evident and the relative lack of progress of six of his students (the six with inadequate prerequisites) was apparent. However, Mr. Beaty believed he could help these individuals by personally supplementing the programmed materials.

After classes had been in session about two weeks, the Center director began asking for reports on the results being achieved through CAI. The IMC coordinator began asking why none of the first-year electronics students was using the computer terminals.

Since he had asked for the terminals, had presented data showing how they would help his class, and had spent a great deal of time and money for preparation of the computer program, Mr. Beaty began encouraging his students to use the computer system. As each student went to the IMC for the first time, he went along to explain the purpose of the CAI system and to demonstrate its use. Unfortunately, this was also his last trip to the IMC with each student, as he could not leave his class.

Even after each student had been introduced to the CAI system, Mr. Beaty found that few students were actually using the system. Most were depending on the programmed texts which were stored in shelves at the back of the classroom. Progress of the six students who were having difficulty depended upon Mr. Beaty's personal attention to such an extent that small-group sessions were scheduled for these individuals.

To promote greater use of the CAI system, Mr. Beaty declared that each individual would spend a minimum of three hours utilizing the system each week. Indeed, he set up a form with the help of the IMC coordinator whereby each student was checked in and checked out.

As this procedure was enforced, the rate of progress of all of the students lessened. Indeed, he found that the amount of his time spent with each individual was increasing. Some individuals were spending less and less time at work in the laboratory and more and more time working at the IMC and/or reading the programmed texts.

At the end of the first semester Mr. Beaty was disappointed in the progress achieved by his students. Since he was to report on progress to the Center director, he assembled the students to discuss their progress and to ask them to discuss their reactions to CAI and programmed texts.

NOTES

Compare your completed written critiques of the Case Studies with the Model Critiques given below. Your responses need not exactly duplicate the model responses; however, you should have covered the same **major** points.

MODEL CRITIQUES

Case Study 1:

It appeared that Ms. Mabe had thoroughly planned this lesson for her class. She had prepared the physical setting and gathered the required materials and supplies. Ms. Mabe explained the type of text for the students, demonstrated its proper use, and emphasized that the text was self-instructional in nature and that there should be minimum communication with others during the use of the program. She also gave students the opportunity to evaluate the program when they had completed it.

Ms. Mabe had, however, overlooked several important factors. First, she seems to have planned to use the program at a time convenient for her, rather than at a time when student progress and readiness called for it. By announcing to students that she had important reports to complete, students were made to feel that they would be **interfering** if they asked for assistance. When students did come for assistance, she was very upset by their questions and revealed this in her answers to them. Students should also have been informed of the procedure they should follow after completing the program. In fact, Ms. Mabe probably should have planned specific enrichment activities. For the teacher to have to explain that personal projects were available after some students had finished the program only interrupted those students that had not completed the program.

Ms. Mabe did not communicate with students while they were working on the program. She was surprised by the fact that some students had not completed the program during the scheduled time and by their opinions of the program. Her five-class time limit violated the self-pacing concept of programmed instruction.

Ms. Mabe had planned for the use of the program, but she seems not to have selected the most appropriate programmed materials for this class. Several students had difficulty with the terminology, and some students were unable to complete the activity. Her most serious error, however, was in failing to properly supervise students' work with the programmed materials.

Case Study 2:

Mr. Beaty had done many things to help ensure the success of CAI for his students. He had previously used programmed materials and was familiar with them. Release time was provided for Mr. Beaty to prepare the computer program and special terminals were purchased. Mr. Beaty met with his class and explained the new instructional process, provided each student with needed materials, and demonstrated the use of the materials. He accompanied students to the IMC to explain the system to them. Also, students were asked to discuss their progress and experiences with CAI and programmed texts at the end of the class.

However, this was not enough preparation to ensure success. Mr. Beaty overlooked several important factors. (1) Mr. Beaty made a direct transfer of material from a text to the computer. The best use of the computer would have been made if Mr. Beaty had put **supplementary** material on the computer to **enhance** the text program or used only the computer to present the material. (2) By placing the terminals in the IMC, Mr. Beaty made using the computer an inconvenience for his students. The computer should have been as available as the text program if the students were expected to use both. (3) Students without the proper background and knowledge should not have been in the class. These students required too much of Mr. Beaty's time, and he was unable to assist other students. (4) Requiring students to use the computer for a specific period of time and to check in and check out of the IMC put additional stress on the students and violated the self-pacing concept of programmed instruction. Students should have been encouraged to use the computer, and all conditions should have been such that they would have wanted to use it. (5) Mr. Beaty or someone knowledgeable in electronics should have been available in the IMC to provide needed assistance whenever the students were there.

Mr. Beaty should carefully analyze the results of this class, and make a decision either to use only the programmed text, or to make more appropriate use of the computer.

LEVEL OF PERFORMANCE: Your completed critiques should have covered the same major points as the model responses. If you missed some points or have questions about any additional points you made, review the material in the information sheet, Using Programmed Instruction, pp. 27–29, or check with your resource person if necessary.

Learning Experience III

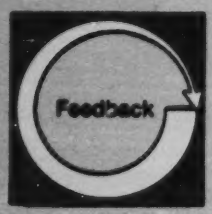
FINAL EXPERIENCE

In an **actual school situation,*** employ programmed instruction.

As you plan your lessons, decide when programmed instruction could be used effectively to aid in meeting the lesson objectives. Based on those decisions, employ programmed instruction. This will include—

- selecting, modifying, or developing a lesson plan(s) which includes this technique
- selecting, obtaining, and previewing the appropriate programmed materials
- arranging for any necessary equipment
- explaining the use of the materials and equipment to students
- supervising students as they work through the program

NOTE Your resource person may want you to submit your written lesson plan(s) to him/her for evaluation before you present your lesson(s). It may be helpful for your resource person to use the TPAF from Module B–4, *Develop a Lesson Plan*, to guide his/her evaluation.



Arrange in advance to have your resource person observe at least one lesson in which students are working with the programmed materials.

Your total competency will be assessed by your resource person, using the Teacher Performance Assessment Form, pp. 45–46.

Based upon the criteria specified in this assessment instrument, your resource person will determine whether you are competent in employing programmed instruction.

*For a definition of "actual school situation," see the inside back cover.

NOTES

TEACHER PERFORMANCE ASSESSMENT FORM

Employ Programmed Instruction (C–28)

Directions: Indicate the level of the teacher's accomplishment by placing an X in the appropriate box under the LEVEL OF PERFORMANCE heading. If, because of special circumstances, a performance component was not applicable, or impossible to execute, place an X in the N/A box.

Name _____

Date _____

Resource Person _____

	LEVEL OF PERFORMANCE					
	N/A	None	Poor	Fair	Good	Excellent
In employing programmed instruction, the teacher:						
1. took into consideration the following factors:						
a. the needs, interests, and abilities of the students	☐	☐	☐	☐	☐	☐
b. the lesson objective(s)	☐	☐	☐	☐	☐	☐
c. the subject matter to be covered	☐	☐	☐	☐	☐	☐
d. the available time	☐	☐	☐	☐	☐	☐
e. the relative costs of different instructional methods	☐	☐	☐	☐	☐	☐
2. selected programmed materials which met the following criteria:						
a. prepared by reputable personnel	☐	☐	☐	☐	☐	☐
b. exhibit quality workmanship	☐	☐	☐	☐	☐	☐
c. clearly specify the performance objectives to be achieved	☐	☐	☐	☐	☐	☐
d. contain relevant content	☐	☐	☐	☐	☐	☐
e. contain accurate information	☐	☐	☐	☐	☐	☐
f. contain up-to-date information	☐	☐	☐	☐	☐	☐
g. require a realistic amount of time for completion	☐	☐	☐	☐	☐	☐
h. written at an appropriate level of difficulty	☐	☐	☐	☐	☐	☐
i. field tested and shown to be effective	☐	☐	☐	☐	☐	☐
j. worth their cost in relation to instructional value	☐	☐	☐	☐	☐	☐
k. suited for use in existing facilities	☐	☐	☐	☐	☐	☐
l. free of bias and other undesirable content	☐	☐	☐	☐	☐	☐
m. contain adequate examples and illustrations	☐	☐	☐	☐	☐	☐
3. made available all necessary materials and equipment	☐	☐	☐	☐	☐	☐

	N/A	None	Poor	Fair	Good	Excellent
4. set up any required equipment according to the manufacturer's recommendations	☐	☐	☐	☐	☐	☐
5. arranged the physical setting in advance to facilitate the learning activities for each student	☐	☐	☐	☐	☐	☐
6. responded to students comments or questions concerning the materials and how to use them	☐	☐	☐	☐	☐	☐
7. explained the use of the materials to students, including:						
a. the differences between conventional learning materials and the programmed format	☐	☐	☐	☐	☐	☐
b. how to gain access to, review, and respond to materials	☐	☐	☐	☐	☐	☐
c. the proper use of introductions, reviews, summaries, self-tests, and other program information and equipment	☐	☐	☐	☐	☐	☐
8. supervised the students' use of programmed materials, including:						
a. maintaining an orderly, businesslike learning setting free from distractions	☐	☐	☐	☐	☐	☐
b. moving quietly and inconspicuously about the room supplementing the programmed materials, checking student progress, and helping individual students	☐	☐	☐	☐	☐	☐
c. providing enrichment activities for students who complete the program early	☐	☐	☐	☐	☐	☐
9. summarized, or had students summarize, the program content	☐	☐	☐	☐	☐	☐
10. obtained student feedback of their understanding of the information presented	☐	☐	☐	☐	☐	☐

LEVEL OF PERFORMANCE: All items must receive N/A, GOOD, or EXCELLENT responses. If any item receives a NONE, POOR, or FAIR response, the teacher and resource person should meet to determine what additional activities the teacher needs to complete in order to reach competency in the weak area(s).

NOTES

NOTES

ABOUT USING THE CENTER'S PBTE MODULES

Organization

Each module is designed to help you gain competency in a particular skill area considered important to teaching success. A module is made up of a series of learning experiences, some providing background information, some providing practice experiences, and others combining these two functions. Completing these experiences should enable you to achieve the terminal objective in the final learning experience. The final experience in each module always requires you to demonstrate the skill in an actual school situation when you are an intern, a student teacher, or an inservice teacher.

Procedures

Modules are designed to allow you to individualize your teacher education program. You need to take only those modules covering skills which you do not already possess. Similarly, you need not complete any learning experience within a module if you already have the skill needed to complete it. Therefore, before taking any module, you should carefully review (1) the introduction, (2) the Objectives listed on p. 4, (3) the Overviews preceding each learning experience, and (4) the Final Experience. After comparing your present needs and competencies with the information you have read in these sections, you should be ready to make one of the following decisions:

- that you do not have the competencies indicated, and should complete the entire module
- that you are competent in one or more of the enabling objectives leading to the final learning experience, and thus can omit that (those) learning experience(s)
- that you are already competent in this area, and ready to complete the final learning experience in order to "test out"
- that the module is inappropriate to your needs at this time

When you are ready to take the final learning experience and have access to an actual school situation, make the necessary arrangements with your resource person. If you do not complete the final experience successfully, meet with your resource person and arrange (1) to repeat the experience, or (2) complete (or review) previous sections of the module or other related activities suggested by your resource person before attempting to repeat the final experience.

Options for recycling are also available in each of the learning experiences preceding the final experience. Any time you do not meet the minimum level of performance required to meet an objective, you and your resource person may meet to select activities to help you reach competency. This could involve (1) completing parts of the module previously skipped; (2) repeating activities; (3) reading supplementary resources or completing additional activities suggested by the resource person; (4) designing your own learning experience; or (5) completing some other activity suggested by you or your resource person.

Terminology

Actual School Situation . . . refers to a situation in which you are actually working with, and responsible for, secondary or post-secondary vocational students in a real school. An intern, a student teacher, or an in-service teacher would be functioning in an actual school situation. If you do not have access to an actual school situation when you are taking the module, you can complete the module up to the final learning experience. You would then do the final learning experience later; i.e., when you have access to an actual school situation.

Alternate Activity or Feedback . . . refers to an item or feedback device which may **substitute** for required items which, due to special circumstances, you are unable to complete.

Occupational Specialty . . . refers to a specific area of preparation within a vocational service area (e.g., the service area Trade and Industrial Education includes occupational specialties such as automobile mechanics, welding, and electricity).

Optional Activity or Feedback . . . refers to an item which is not required, but which is designed to **supplement** and enrich the required items in a learning experience.

Resource Person . . . refers to the person in charge of your educational program; the professor, instructor, administrator, supervisor, or cooperating/supervising/classroom teacher who is guiding you in taking this module.

Student . . . refers to the person who is enrolled and receiving instruction in a secondary or post-secondary educational institution.

Vocational Service Area . . . refers to a major vocational field: agricultural education, business and office education, distributive education, health occupations education, home economics education, industrial arts education, technical education, or trade and industrial education.

You or the Teacher . . . refers to the person who is taking the module.

Levels of Performance for Final Assessment

N/A . . . The criterion was not met because it was **not applicable** to the situation.
None . . . **No attempt** was made to meet the criterion, although it was relevent.
Poor . . . The teacher is unable to perform this skill or has only **very limited ability** to perform it.
Fair . . . The teacher is unable to perform this skill in an acceptable manner, but has **some ability** to perform it.
Good . . . The teacher is able to perform this skill in an **effective** manner.
Excellent . . . The teacher is able to perform this skill in a **very effective** manner.

Titles of The Center's Performance-Based Teacher Education Modules

A–1 Prepare for a Community Survey
A–2 Conduct a Community Survey
A–3 Report the Findings of a Community Survey
A–4 Organize an Occupational Advisory Committee
A–5 Maintain an Occupational Advisory Committee
A–6 Develop Program Goals and Objectives
A–7 Conduct an Occupational Analysis
A–8 Develop a Course of Study
A–9 Develop Long-Range Program Plans
A–10 Conduct a Student Follow-Up Study
A–11 Evaluate Your Vocational Program

Category B: Instructional Planning

B–1 Determine Needs and Interests of Students
B–2 Develop Student Performance Objectives
B–3 Develop a Unit of Instruction
B–4 Develop a Lesson Plan
B–5 Select Student Instructional Materials
B–6 Prepare Teacher-Made Instructional Materials

Category C: Instructional Execution

C–1 Direct Field Trips
C–2 Conduct Group Discussions, Panel Discussions, and Symposiums
C–3 Employ Brainstorming, Buzz Group, and Question Box Techniques
C–4 Direct Students in Instructing Other Students
C–5 Employ Simulation Techniques
C–6 Guide Student Study
C–7 Direct Student Laboratory Experience
C–8 Direct Students in Applying Problem-Solving Techniques
C–9 Employ the Project Method
C–10 Introduce a Lesson
C–11 Summarize a Lesson
C–12 Employ Oral Questioning Techniques
C–13 Employ Reinforcement Techniques
C–14 Provide Instruction for Slower and More Capable Learners
C–15 Present an Illustrated Talk
C–16 Demonstrate a Manipulative Skill
C–17 Demonstrate a Concept or Principle
C–18 Individualize Instruction
C–19 Employ the Team Teaching Approach
C–20 Use Subject Matter Experts to Present Information
C–21 Prepare Bulletin Boards and Exhibits
C–22 Present Information with Models, Real Objects, and Flannel Boards
C–23 Present Information with Overhead and Opaque Materials
C–24 Present Information with Filmstrips and Slides
C–25 Present Information with Films
C–26 Present Information with Audio Recordings
C–27 Present Information with Televised and Videotaped Materials
C–28 Employ Programmed Instruction
C–29 Present Information with the Chalkboard and Flip Chart

Category D: Instructional Evaluation

D–1 Establish Student Performance Criteria
D–2 Assess Student Performance: Knowledge
D–3 Assess Student Performance: Attitudes
D–4 Assess Student Performance: Skills
D–5 Determine Student Grades
D–6 Evaluate Your Instructional Effectiveness

Category E: Instructional Management

E–1 Project Instructional Resource Needs
E–2 Manage Your Budgeting and Reporting Responsibilities
E–3 Arrange for Improvement of Your Vocational Facilities
E–4 Maintain a Filing System
E–5 Provide for Student Safety
E–6 Provide for the First Aid Needs of Students
E–7 Assist Students in Developing Self-Discipline
E–8 Organize the Vocational Laboratory
E–9 Manage the Vocational Laboratory

Category F: Guidance

F–1 Gather Student Data Using Formal Data-Collection Techniques
F–2 Gather Student Data Through Personal Contacts
F–3 Use Conferences to Help Meet Student Needs
F–4 Provide Information on Educational and Career Opportunities
F–5 Assist Students in Applying for Employment or Further Education

Category G: School-Community Relations

G–1 Develop a School-Community Relations Plan for Your Vocational Program
G–2 Give Presentations to Promote Your Vocational Program
G–3 Develop Brochures to Promote Your Vocational Program
G–4 Prepare Displays to Promote Your Vocational Program
G–5 Prepare News Releases and Articles Concerning Your Vocational Program
G–6 Arrange for Television and Radio Presentations Concerning Your Vocational Program
G–7 Conduct an Open House
G–8 Work with Members of the Community
G–9 Work with State and Local Educators
G–10 Obtain Feedback about Your Vocational Program

Category H: Student Vocational Organization

H–1 Develop a Personal Philosophy Concerning Student Vocational Organizations
H–2 Establish a Student Vocational Organization
H–3 Prepare Student Vocational Organization Members for Leadership Roles
H–4 Assist Student Vocational Organization Members in Developing and Financing a Yearly Program of Activities
H–5 Supervise Activities of the Student Vocational Organization
H–6 Guide Participation in Student Vocational Organization Contests

Category I: Professional Role and Development

I–1 Keep Up-to-Date Professionally
I–2 Serve Your Teaching Profession
I–3 Develop an Active Personal Philosophy of Education
I–4 Serve the School and Community
I–5 Obtain a Suitable Teaching Position
I–6 Provide Laboratory Experiences for Prospective Teachers
I–7 Plan the Student Teaching Experience
I–8 Supervise Student Teachers

Category J: Coordination of Cooperative Education

J–1 Establish Guidelines for Your Cooperative Vocational Program
J–2 Manage the Attendance, Transfers, and Terminations of Co-Op Students
J–3 Enroll Students in Your Co-Op Program
J–4 Secure Training Stations for Your Co-Op Program
J–5 Place Co-Op Students on the Job
J–6 Develop the Training Ability of On-the-Job Instructors
J–7 Coordinate On-the-Job Instruction
J–8 Evaluate Co-Op Students' On-the-Job Performance
J–9 Prepare for Students' Related Instruction
J–10 Supervise an Employer-Employee Appreciation Event

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Student Guide to Using Performance-Based Teacher Education Materials
Resource Person Guide to Using Performance-Based Teacher Education Materials
Guide to the Implementation of Performance-Based Teacher Education

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